

I claim:

- 1 1. An optical system, comprising:
  - 2 a first micromirror array, comprising micromirrors and non-mirrored
  - 3 regions;
  - 4 a second micromirror array, comprising micromirrors and non-mirrored
  - 5 regions; and
  - 6 a ray-forming device, wherein the ray-forming device separates a light
  - 7 image into image components, wherein a first image component is received by
  - 8 the first micromirror array, a second image component is received by the second
  - 9 micromirror array, a third image component sent from the first micromirror array
  - 10 and a fourth image component sent from the second micromirror array are
  - 11 combined at the ray-forming device to produce a composite image with a perfect
  - 12 or nearly perfect fill factor.
- 1 2. The optical system of claim 1, wherein the ray-forming device is a beam
- 2 splitter.
- 1 3. The optical system of claim 1, wherein the micromirrors and the non-
- 2 mirrored regions of the first micromirror array are alternately disposed in a
- 3 checkerboard-like arrangement.
- 1 4. The optical system of claim 3, wherein the micromirrors and the non-
- 2 mirrored regions of the second micromirror array are alternately disposed in a
- 3 checkerboard-like arrangement and the second micromirror array is
- 4 complementary to the first micromirror array.
- 1 5. The optical system of claim 1, wherein each micromirror further
- 2 comprising a control and support region comprising at least a mirror support
- 3 post, support circuitry, and pads, wherein the mirror support post is disposed

4   beneath the micromirror, but the support circuitry and pads are disposed  
5   beneath a non-mirrored region adjacent to the micromirror.

1   6.    The optical system of claim 1, wherein the micromirrors are square in  
2   shape.

1   7.    The optical system of claim 1, wherein the micromirrors are circular in  
2   shape.

1   8.    The optical system of claim 1, wherein the ray-forming device further  
2   comprises transparent surfaces and reflective surfaces, in which the transparent  
3   surfaces are alternately disposed adjacent to the reflective surfaces in a  
4   checkerboard-like arrangement.

1   9.    The optical system of claim 1, wherein the composite image is displayed.

1   10.   The optical system of claim 1, wherein the composite image is projected.

1   11.   The optical system of claim 1, further comprising a birefringent crystal,  
2   wherein the first image component and the second image component are  
3   produced by the birefringent crystal.

1   12.   The optical system of claim 1, further comprising a system of mirrors,  
2   wherein the first image component and the second image component are  
3   produced by the system of mirrors.

1   13.   The optical system of claim 1, further comprising:  
2        a third micromirror array, comprising micromirrors and non-mirrored  
3   regions;

4           a fourth micromirror array, comprising micromirrors and non-mirrored  
5 regions.

1   14.   An optical system, comprising:  
2           a first microshutter array, comprising transparent and opaque regions;  
3           a second microshutter array, comprising transparent and opaque regions;  
4   and  
5           a ray-forming device, wherein the ray-forming device separates a light  
6 image into image components, wherein a first image component is received by  
7 the first microshutter array, a second image component is received by the  
8 second microshutter array, a third image component sent from the first  
9 microshutter array and a fourth image component sent from the second  
10 microshutter array are combined at the ray-forming device to produce a  
11 composite image with a fill factor of one hundred or nearly one hundred percent.

1   15.   The optical system of claim 14, wherein the ray-forming device is a beam  
2 splitter.

1   16.   The optical system of claim 14, wherein the transparent and the opaque  
2 regions of the first microshutter array are alternately disposed in a checkerboard-  
3 like arrangement.

1   17.   The optical system of claim 16, wherein the transparent and the opaque  
2 regions of the second microshutter array are alternately disposed in a  
3 checkerboard-like arrangement and the second microshutter array is  
4 complementary to the first microshutter array.

1   18.   A method, comprising:  
2           receiving a light image into a ray-forming device;

3 separating the light image into first and second image components by the  
4 ray-forming device;

5 receiving the first image component by a first micromirror array, wherein  
6 the first image component is reflected off a plurality of micromirrors in the first  
7 micromirror array to produce a third image component;

8 receiving the second image component by a second micromirror array,  
9 wherein the second image component is reflected off a plurality of micromirrors  
10 in the second micromirror array to produce a fourth image component; and

11 combining the third and fourth image components together as a  
12 composite image, wherein the composite image has a substantially perfect fill  
13 factor.

1 19. The method of claim 18, further comprising:  
2 projecting the composite image.

1 20. The method of claim 18, further comprising:  
2 displaying the composite image.

1 21. A micromirror array, comprising:  
2 a non-mirrored surface, one of a plurality of non-mirrored surfaces;  
3 a micromirror, wherein the micromirror is part of a plurality of  
4 micromirrors which are alternately disposed with the non-mirrored surfaces in a  
5 checkerboard-like pattern; and  
6 a control and support region, one of a plurality of control and support  
7 regions, one for each of the plurality of micromirrors, wherein each control and  
8 support region comprising a micromirror support post, support circuitry, and  
9 pads;  
10 wherein the micromirror support post is disposed beneath the micromirror while  
11 the support circuitry and the pads are disposed beneath the non-mirrored  
12 surface.

1 22. The micromirror array of claim 21, wherein the micromirror is square in  
2 shape.

1 23. The micromirror array of claim 21, wherein the micromirror is circular in  
2 shape.